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SAYBROOK II—Base System: \$895

- SAYBROOK II—Advanced System: \$995**

- BOTH SYSTEMS ALSO AVAILABLE IN 12.5 MHz and 14 MHz:**

12.5 MHz Base System: \$1195

12.5 MHz Advanced System: \$1295

14.0 MHz Base System: \$1395

14.0 MHz Advanced System: \$1495

SAYBROOK II OPTIONS: (Available Spring 1984)

- UNIX
- CP/M-68K
- "C" Language
- 512K on-board expansion
- 128K-2Mb RAM card designed by Legend Industries

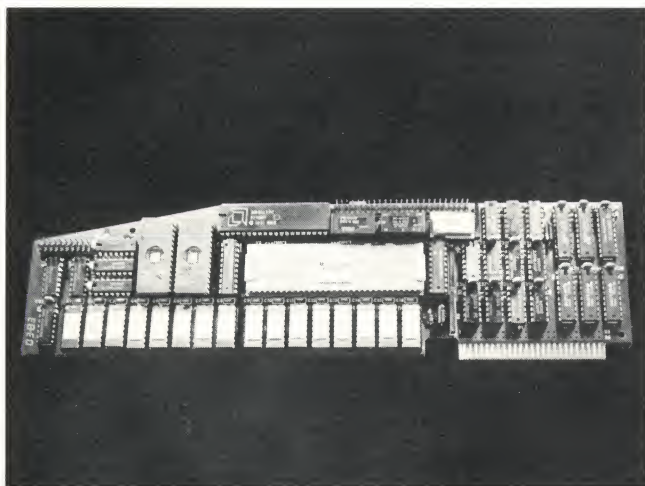


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Saybrook™



SAYBROOK OVERVIEW

Saybrook is a 32/16 bit co-processor for the Apple II personal computer, based upon the Motorola 68000 microprocessor. Saybrook provides Apple users with the power and speed of a micro-mainframe with 128K bytes of RAM (expandable on-board to 512K RAM). Saybrook comes with the 8 MHz version of the 68000, which can be upgraded to 12.5 MHz for speed-critical applications. In addition, five counter/timers are incorporated, which are used for hardware functions as well as providing a 24-hour time-of-day clock and an operating system timer for multiprocessing support. The Saybrook software includes the UCSD p-System as well as the basic Saybrook support. The p-System Pascal, BASIC, and FORTRAN-77 compilers and 68000 assembler are included in the basic package. Applesoft-compatible 68000 BASIC is included, and will run most Applesoft programs without modification. This combination allows users to access the enormous UCSD-p library of applications software, as well as giving users the capability of running the vast majority of Apple, Pascal, FORTRAN, and BASIC programs on Saybrook—ten to twenty times faster. The CP/M-68K and UNIX operating systems will soon be available.

FEATURES

HARDWARE

- 8 MHz Motorola 68000 central processor (12.5 MHz upgrade option available)
- 128K byte system RAM memory on-board (512K RAM upgrade option available)
- 5 16-bit counter/timers, including 24-hour clock
- 32-bit architecture, 16-bit Saybrook interface
- 8-bit Apple interface hardware
- 16M byte address space
- Non-existent address reference trap
- Basic diagnostics
- Hardware expansion connector

SOFTWARE

Standard

- MACSBUG 1.31 Monitor (modified)
- Apple/Saybrook disk-based diagnostics
- UCSD p-System Version IV
- Pascal, FORTRAN-77, BASIC compilers
- Applesoft-compatible 68000 BASIC
- 68000 assembler

Available soon

- CP/M-68K optional
- UNIDOS (UNIX Version 7 compatible) optional

CENTRAL PROCESSOR

Saybrook is designed to extract as much performance as possible from the Motorola 68000 microprocessor while satisfying the severe physical constraints imposed by the Apple II peripheral slot size. Saybrook operates at 8 MHz with 128K RAM (no wait states), but is upgradable to 12.5 MHz for speed-critical applications (the fastest VLSI microprocessor in volume production). The internal data path on Saybrook is 16 bits while the Apple bus path is limited to 8 bits.

MEMORY

Saybrook uses 64K RAM chips (currently the highest capacity in volume production) to implement 128K bytes of system RAM. Saybrook can be upgraded to 12.5 MHz operation, using the standard RAM with wait states, or the RAM chips can be replaced to allow Saybrook to run at maximum speed without wait states. In addition, the memory array is designed to take advantage of the newest 256K RAM chips, increasing the system RAM capacity to 512K.

SYSTEM ROM

The 16K bytes of ROM memory on Saybrook contain the basic monitor functions needed to operate Saybrook. These functions include power-up initialization, basic diagnostics, and a modified MACSBUG 1.31 monitor which is compatible with the early 68000 Design Module. The ROM is expandable also, using the new 128K and 256K EPROMs as volume production begins, up to 32K and 64K bytes.

TIMER/COUNTERS

Saybrook utilizes the 9513 VLSI timer from Advanced Micro Devices to provide a number of significant features. Since Saybrook makes full use of the DTACK signal, one timer is devoted to detecting non-existent address references and notifying the user. The other timers provide a 24-hour time-of-day clock as well as an operating system quantum clock for multiprocessing support.

APPLE INTERFACE

The Apple interface hardware on Saybrook permits the 68000 microprocessor to treat the Apple as a subset of its own address space, allowing the 68000 to access or control any location in the Apple, including all the peripheral slots. The hardware logic performs the necessary synchronization, cycle-stealing, and byte-switching functions to access the Apple.

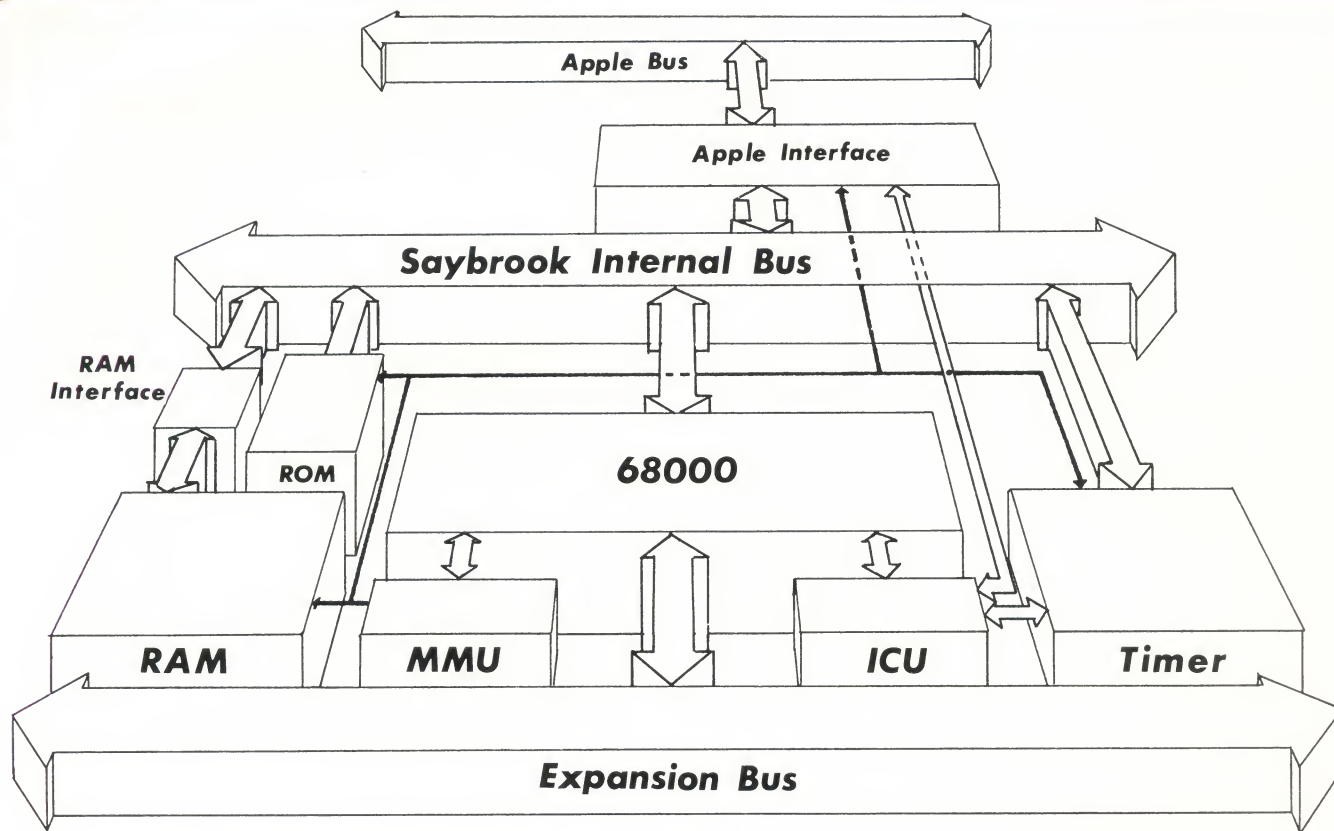
EXPANSION

Saybrook can be extended in a number of ways through an expansion connector on the board. The expansion connector allows access to all the 68000 control, address, and data signals for off-board expansion through a connecting cable. Through this connector, Saybrook can be configured with up to 16 Megabytes of memory, multiple Saybrook processors, or additional peripherals.

SOFTWARE

The standard operating system supplied with Saybrook is the UCSD p-System. This system allows recompiled Apple Pascal programs to run on Saybrook, as well as p-System programs written on any other computer running the p-System. The p-System includes the Pascal, BASIC, and FORTRAN-77 compilers and the 68000 assembler, as well as a full complement of utilities including a screen-oriented editor and file handler. Saybrook accesses the enormous library of p-System applications software, and allows users to run this software on the 68000, utilizing its tremendous speed advantage over the Apple II. In addition, an Applesoft-compatible 68000 BASIC comes with Saybrook, allowing most Applesoft programs to run on Saybrook without modification. Basic disk diagnostics exercise both Saybrook and the Apple computer for increased reliability.

The CP/M-68K and UNIX operating systems will be available soon.



OPTIONS

- | | |
|------------------|--|
| 512K RAM Upgrade | Upgrades Saybrook RAM to 512K <ul style="list-style-type: none"> • 16 256K RAM chips |
| 12.5 MHz Upgrade | Upgrades Saybrook to run at 12.5 MHz <ul style="list-style-type: none"> • 12.5 MHz 68000 • 25 MHz Oscillator • Fast TTL chips |

Saybrook is a trademark of Analytical Engines, Inc. **Apple II** is a registered trademark of Apple Computer, Inc. **UCSD p-System** is a trademark of The Regents Of The University of California. **CP/M-68K** is a registered trademark of Digital Research. **UNIX** is a trademark of Bell Laboratories.

NOTE: The information set forth in this product brief is descriptive only. For detailed specifications, consult the Analytical Engines, Inc. technical manual for this product.



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